

Appl. No. 10/596,690
Amendment Dated April 9, 2009
Reply to Office Action of January 12, 2009

Amendments to the Drawings:

Attached are three sheets of replacement drawing. The first replacement sheet, which includes Fig. 4, replaces the original sheet including Fig. 4. The second replacement sheet, which includes Fig. 5, replaces the original sheet including Fig. 5. The third replacement sheet, which includes Fig. 6, replaces the original sheet including Fig. 6. The replacement sheets include black and white photographs which are identical photos but merely clearer images.

Attachment: 3 Replacement Sheet

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Remarks:

Reconsideration of the application is requested. Claims 28-50 remain in the application. Claim 28 has been amended.

Drawings

In item 1 of the Office action, the Examiner objected to the drawings. The Examiner objected to Figs. 1-3 as not providing enough detail to cover the scope of the claimed invention. The Examiner objected to Figs. 4-6 as photographs, “which are not excepted [sic] by the USPTO without a petition.”

With regard to Figs. 1-3, Applicant respectfully disagrees with the Examiner. All of the features of the claims are shown and fully identified by numerals that correspond to the relevant description in the specification. If there are specific items that are not shown, the Examiner is requested to provide a list or specific objections.

Figs. 4-6 are black and white photographs. In contrast to the Examiner’s assertion, according to MPEP 608.02 VII. “There is no requirement for a petition or petition fee, and only one set of photographs is required. *See* 1213 O.G. 108 (Aug. 4, 1998) and 1211 O.G. 34 (June 9, 1998) and 37 CFR 1.84(b)(1).” Figs. 4 to 6 are not essential to an understanding of the invention and were provided merely to illustrate a working embodiment of the system that was built and has been successfully used by the inventor to neutralize the waste products from several different types of industrial process. Replacement figures with clearer images are being submitted. The replacement figures are based on the same photograph and contain no new matter.

35 USC 102

In item 3 of the Office action, the Examiner rejected claims 27-28, 30-33, 35-38, and 40-50 as being fully anticipated by Barton et al. ‘877 under 35 U.S.C. § 102(b). The rejection has been noted and the claims have been amended in an effort to define more clearly the invention of the instant application.

Before discussing the prior art in detail, a brief review of the invention as claimed is provided.

The invention according to claim 27 calls for, *inter alia*, the following:

- i. The plasma stream created by the plasma torch and the liquid waste are introduced into the reactor through openings in the walls that face each other on opposite sides of the pyrolysis/reaction chamber.
- ii. The liquid waste is pumped through an atomizer that converts it into a stream of droplets that are sprayed directly into the plasma stream that exits the plasma torch.
- iii. Both the process of disassociation of the molecules of the waste into atoms or ions and the process of recombination of the atoms and ions into stable molecules or product gas take place inside the pyrolysis/reaction chamber.

Barton et al. '877 teaches the following:

- i. Barton et al. '877 teaches two embodiments of the plasma torch. In both the first embodiment [Fig. 1 and col. 4, lines 11-18] and the second [Fig. 6 and col. 4, lines 21-28] the waste material is fed directly into the plasma arc inside of the torch. There are not separate openings in the walls of the reaction vessel through which the plasma stream and the waste enter. The waste is introduced directly into the co-linear electrode space of the plasma torch [*see also* claim 1 and claim 18] and enters the reaction vessel as an integral part of the plasma stream that exits the plasma torch.

Introduction of material directly into the torch can lead to instability of the arc. This was recognized by the inventors of Barton et al. '877 and is the reason for the embodiment shown in Fig. 6 [col. 4, lines 26-28]. Other problems that can result from introducing the waste into the plasma stream inside the torch are unpredictable results from the disassociation of the waste molecules and unpredictable behavior of the torch. These problems can not arise in the system of the present invention.

- ii. In the method and apparatus of Barton et al. '877 the waste is atomized and ionized in the co-linear electrode space in the torch and recombination takes place in the reaction chamber [see for example: claims 1 and 18; col. 3, lines 2-4; col. 5, lines 8-11].
- iii. The inventors of Barton et al. '877 suggest that: "The waste material could be inserted into the reaction chamber and the plasma arc introduced into the chamber to impinge on the waste material." [col. 11, lines 26-29] However, they go on to dismiss this method as not being as effective as theirs and they give no suggestion of how their apparatus should be modified to accomplish this method.

The Examiner has misunderstood or misrepresented some of the features of Barton et al. '877 that he equates to the features of claim 27 (before the present amendment). A few examples are:

- i. The Examiner states that the openings (62, 40, 90) in Barton et al. '877 are equivalent to the three (or more) openings in the walls of the pyrolysis/reaction chamber of the present invention.

Referring to Fig. 2 of the present application one sees the three openings, one in each of three different walls of pyrolysis/reaction chamber 200 through which plasma torch 220 and entrance conduit 150 are introduced into chamber 200 and the opening to exit conduit 230.

Referring to Fig. 1 of Barton et al. '877: 62 is an annular inlet ring coaxially mounted between the torch electrodes for introducing the waste [col. 4, lines 13-16]; 40 is an annular gap between the electrodes to which is connected a high pressure gas supply to produce a vortex in the arc inside the torch [col. 3, lines 35-37]; and 90 is a transverse outlet opening in outlet shield 88 [col. 5, lines 1-3]. Neither 62, nor 40, nor 90 represent an opening in the wall of the reaction vessel 14.

- ii. The Examiner refers to Col 4, lines 18-20 of '877 to show that the inventors contemplate the use of an atomizer. The Examiner has not asked and answered the question that should be investigated when considering if '877 anticipates the present invention. That question is not if the inventors of '877 contemplated the use of an atomizer but rather

where they contemplated locating the atomizer in their apparatus and for what purpose. It is clear that they did not contemplate placing it inside the reactor where it would be used to spray droplets of waste directly into the plasma stream of a plasma torch located facing the atomizer.

Summary: Barton et al. '877 teaches none of features i to iii of claim 1 of the present invention that are listed above. The method according to Barton et al. '877 is conceptually different from those of the present invention and the apparatus taught by Barton et al. '877. Barton et al. '877 comprises significant structural differences with those of the present invention. These differences influence the chemical and physical process that take place in the reaction chamber and therefore have an influence on the results of the treatment of the waste material. For example, it is known that introducing the waste into the plasma stream through the torch, as is done in Barton et al. '877, can cause instability of the output of the torch and unpredictability of the disassociation of the waste. In the apparatus of the present invention, the stability of the torch is unaffected by waste flowing through it and therefore the conditions inside the reaction chamber are stable and accurate predictions of the disassociation and recombination process can be made for a given composition of the waste.

Conclusion: Barton et al. '877 do not anticipate the invention according to claim 27 of the instant application because Barton et al. does not teach all of the features of claim 27.

35 USC § 103

In item 6 of the Office action, the Examiner rejected claims 29 and 34 as being unpatentable over Barton et al. '877 in view of Capote et al. '323 under 35 USC § 103(a).

Claims 29 and 34 are respectively directly and indirectly dependent on claim 27. As shown above Barton et al. '877 does not anticipate the invention according to claim 27. Likewise, Capote et al. '323 do not teach those features of claim 27 that were discussed above.

Therefore, Barton et al. '877 in view of Capote '323 do not teach or suggest the features of claim 27. Therefore, the references fail to form a *prima facie* case of obviousness of claim 27 and the

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claims dependent upon it, specifically claims 29 and 34. Therefore, claims 29 and 34 are not obvious and are patentable.

Conclusion

Because independent claim 27 has been shown to be both novel and not obvious in light of the prior art and claims 28 to 50 are either directly or indirectly dependent on claim 27, it is respectfully submitted that all of the amended claims are now in condition for allowance.

In view of the foregoing, reconsideration and allowance of claims 27-50 are solicited. In the event the Examiner should still find any of the claims to be unpatentable, please telephone counsel so that patentable language can be substituted.

If an extension of time for this paper is required, petition for extension is herewith made.

No fee is believed due. However, please charge any required fee (or credit any overpayments of fees) to the Deposit Account of the undersigned, Account No. 50-0601 (Docket No. 7640-X06-060).

Respectfully submitted,

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